Rush-

153708

PO: 92262

CHAIN OF CUSTODY - SOLID WASTE
CERRO COPPER PRODUCTS- SAUGET, ILLINOIS

SAMPLE NAME: Dead Creek Sediment

SAMPLE I.D. #: 56554
" 55
" 56
" 57

SAMPLING DATE: 8/3/90 TIME: 11:00

SAMPLER'S INITIALS: KM

SAMPLE TRANSPORTATION

SAMPLE CARRIER: Jim Fahey (sign) DATE: 8/3/90 TIME: _____

SAMPLES REC'D By Lab: _____ (sign) DATE: _____ TIME: _____

LABORATORY WORK

LABORATORY: Enviometrics

ADDRESS: _____

PHONE: _____

CONTACT: _____

X TCLP METALS (2) Pb & Cd	X PAINT FILTER TEST	___ Phenol
___ TCLP ORGANICS (25)	___ IGNITABILITY (<140F)	___ TOC
___ TCLP PESTICIDES(4)	___ CORROSIVITY (pH OF 10% SOLN.)	___ TOX or EOX
___ TCLP HERBICIDES(2)	___ REACTIVITY (CN & Sulfide)	___ Cr+6
___ Arsenic (T)	X Total Solids (%)	X PCB (TOTA
___ Barium (T)	___ Mercury (T)	X EP Pb & Cd
X Cadmium (T)	___ Nickel (T)	___ _____
___ Chromium (T)	___ Selenium (T)	___ _____
___ Copper (T)	___ Silver (T)	___ _____
X Lead (T)	___ Zinc (T)	___ _____

Comments: 1. ALL ANALYSIS IS TO BE PERFORMED IN ACCORDANCE WITH SW846

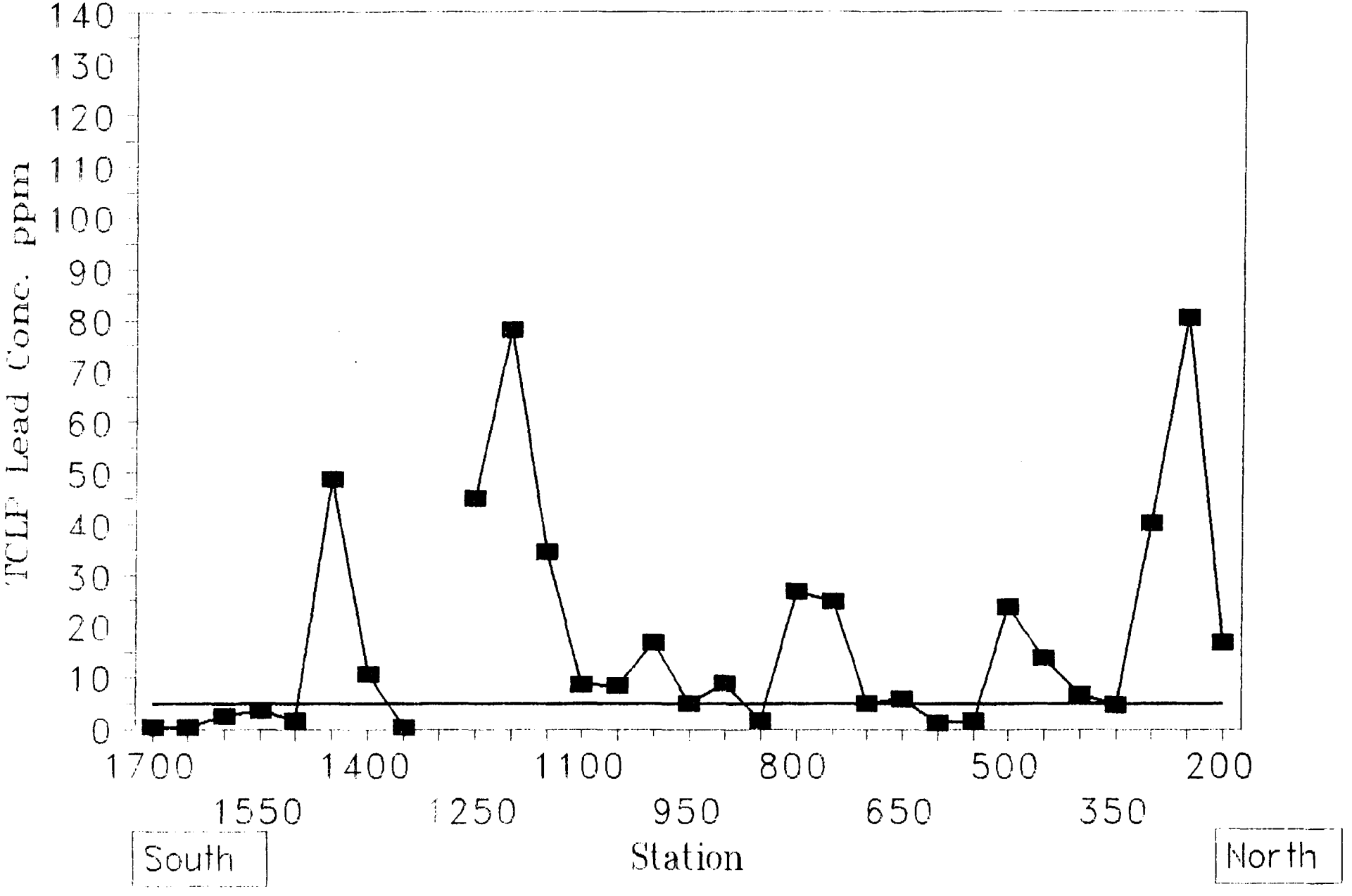
Analysis Requested by: J M Grana

Problems or Question Please Call Representatives Below
Cerro Copper: Joseph Grana or Joe Burroughs (618)337-6000

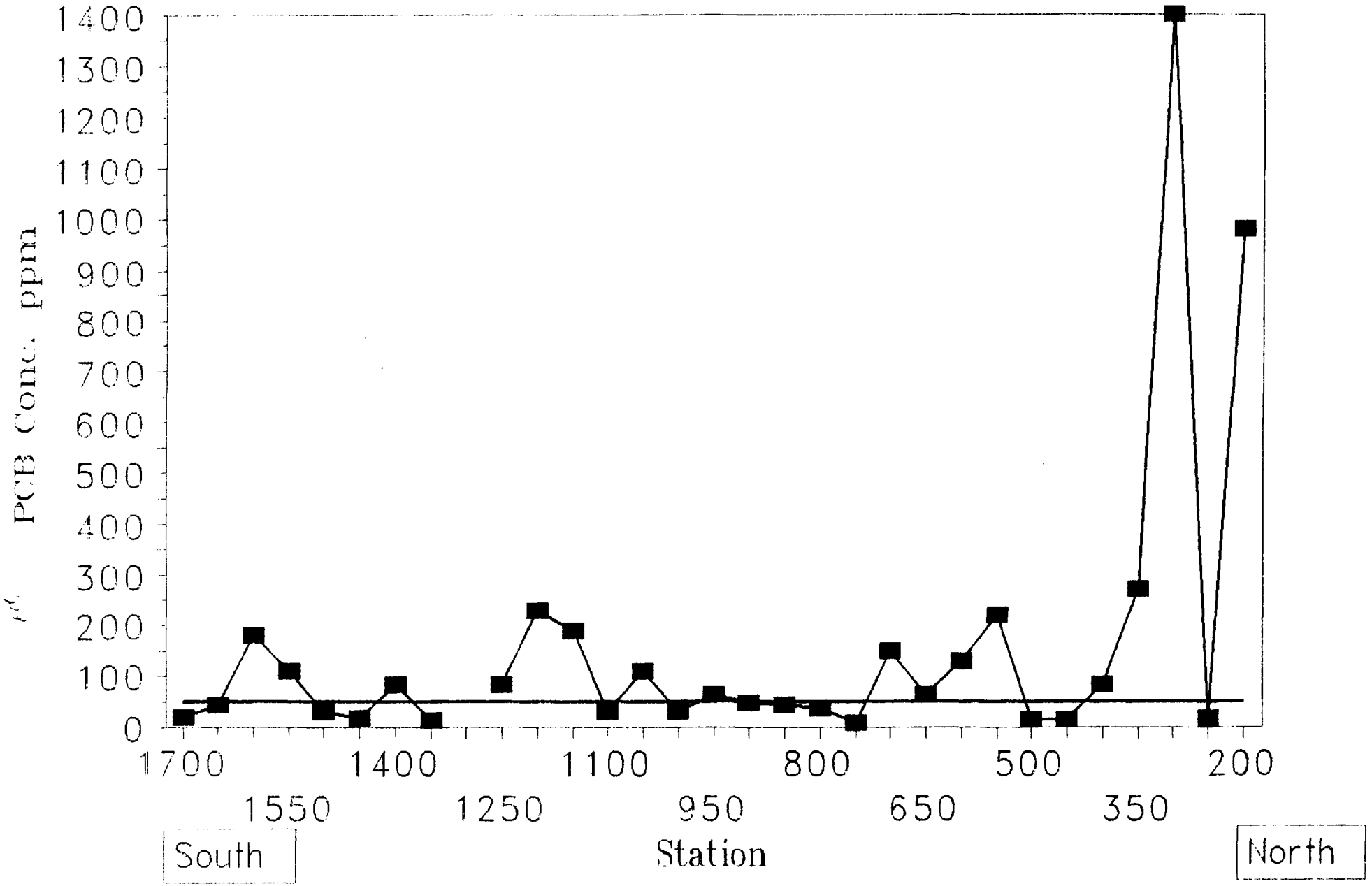
Copy Distribution of Chain-of-Custody
Goldenrod:Sampler's Copy
Yellow:Lab's Copy
Pink:Transporter leaves @ Cerro after signing
White:Lab returns to Cerro after analysis

C115-

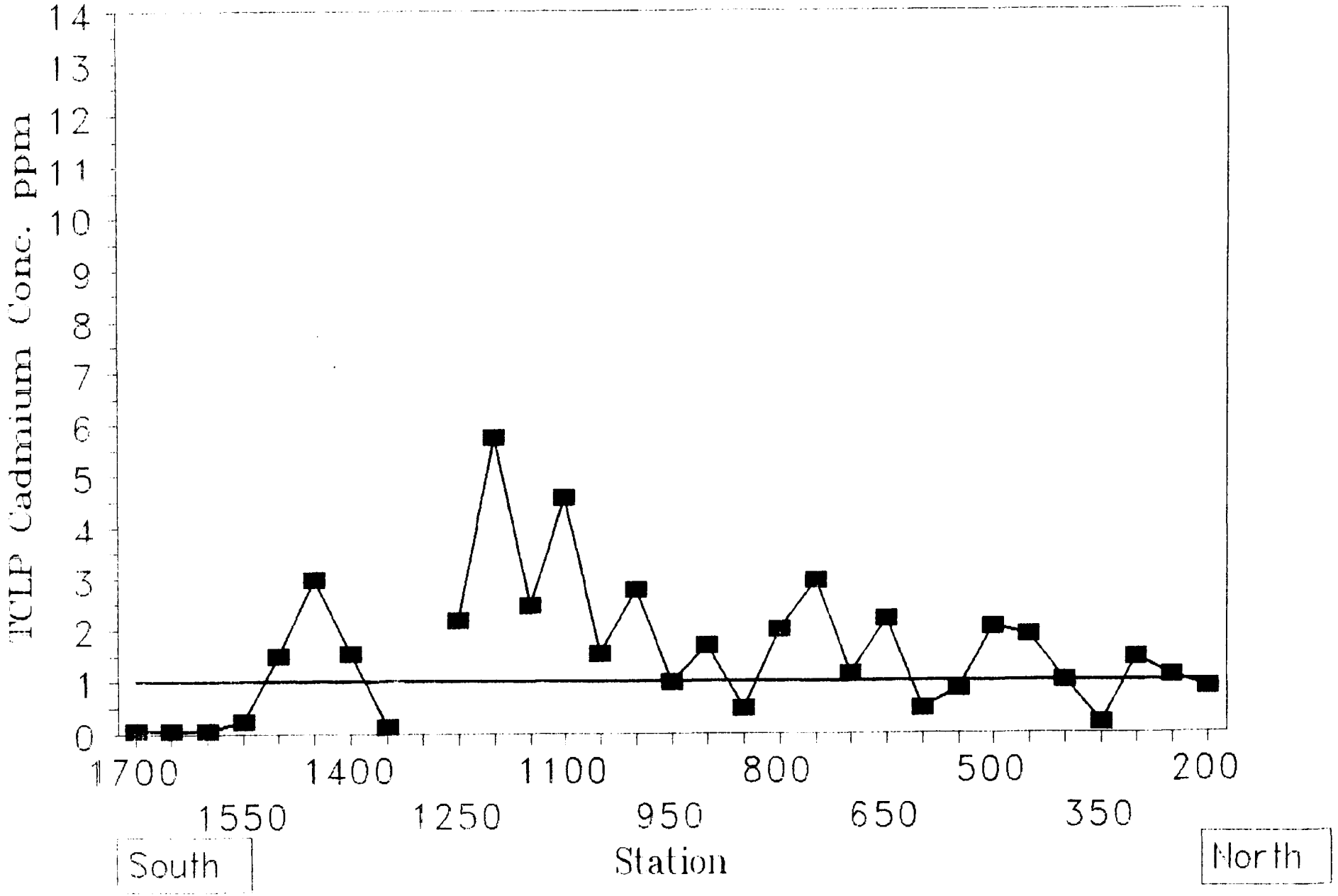
Dead Creek TCLP Lead Analysis
Perland–July 12 & 13, 1990



Dead Creek PCB Analysis
Perland–July 12 & 13, 1990



Dead Creek TCLP Cadmium Analysis
Perland–July 12 & 13, 1990



XC:RA

To: Joe Grana

From: Kevin McGown

Date: August 7, 1990

Subject: EP-TOH metals data results:

Sation	Cadmium(PPM)	Lead(PPM)
14+50	1.950	18.500
12+00	2.140	14.500
7+50	1.230	2.210
3+00	.470	.916
2+50	.490	4.060

Comparison of EP-TOH and TCLP metals

	EP-TOH	EP-TOH	TCLP metals(PPM)	
Station	Cadmium(PPM)	Lead(PPM)	Cadmium	Lead
14+50	1.950	18.500	2.970	48.700
12+00	2.140	14.500	5.740	77.900
7+50	1.230	2.210	2.940	24.800
3+00	.470	.916	1.150	28.300
2+50	.490	4.060	1.100	80.500

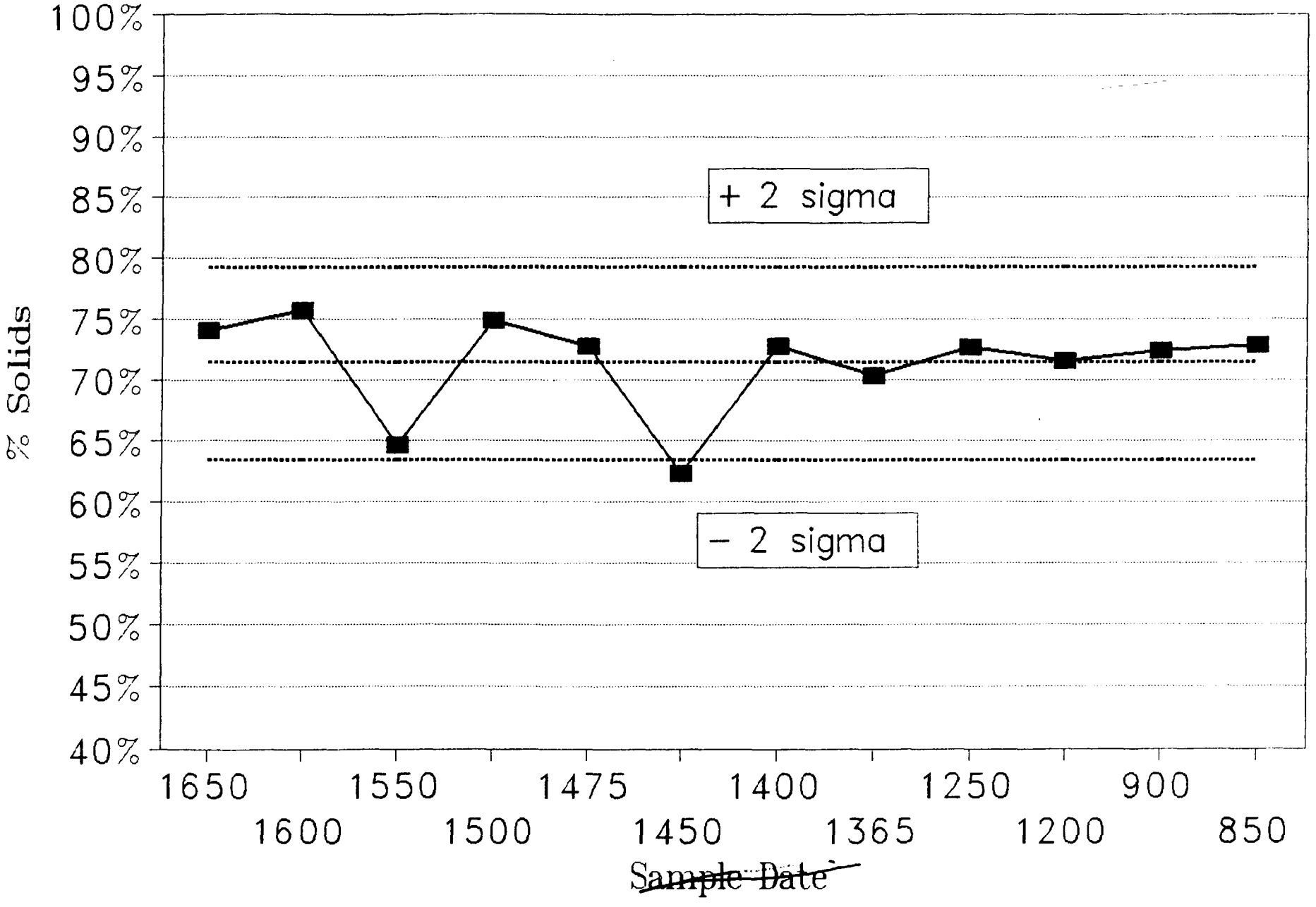
C115-4

CERRO COPPER SEDIMENT SAMPLING - JULY

STATION	FEET FROM TRACK CL	SAMPLE NUMBER (milligrams/liter)	Mercury 0.2	Selenium 1	Silver 5
17+00	97	CSA2-SD-0025-01	0.0002*	0.003*	0.002*
16+50	108	CSA2-SD-0075-01	0.0002*	0.003*	0.002*
16+00	93	CSA2-SD-0125-01	0.0002*	0.015*	0.002*
15+50	98	CSA2-SD-0175-01	0.0002*	0.030*	0.002*
15+50	98	CSA2-SD-0175-01	0.0002*	0.030*	0.002*
15+50	98	CSA2-SD-0175-01	0.0002*	0.030*	0.002*
15+00	98	CSA2-SD-0225-01	0.0002*	0.015*	0.002*
14+50	95	CSA2-SD-0275-01	0.0002*	0.030*	0.002*
14+00	88	CSA2-SD-0325-01	0.0002*	0.030*	0.002*
13+50	89	CSA1-SD-0025-01	0.0002*	0.015*	0.002*
12+50	76	CSA1-SD-0075-01	0.0002*	0.030*	0.002*
12+00	75	CSA1-SD-0125-01	0.0002*	0.030*	0.002*
11+50	66	CSA1-SD-0175-01	0.0002*	0.030*	0.002*
11+00	69	CSA1-SD-0225-01	0.0002*	0.030*	0.002*
10+50	77	CSA1-SD-0275-01	0.0002*	0.030*	0.002*
10+00	72	CSA1-SD-0325-01	0.0002*	0.030*	0.002*
9+50	80	CSA1-SD-0375-01	0.0002*	0.030*	0.002*
9+00	82	CSA1-SD-0425-01	0.0002*	0.003*	0.002*
8+50	72	CSA1-SD-0475-01	0.0002*	0.030*	0.002*
8+00	73	CSA1-SD-0525-01	0.0002*	0.003*	0.002*
8+00	73	CSA1-SD-0525-01	0.0002*	0.006*	0.002*
8+00	73	CSA1-SD-0525-01	0.0002*	0.003*	0.002*
7+50	75	CSA1-SD-0575-01	0.0002*	0.003*	0.002*
7+00	85	CSA1-SD-0625-01	0.0002*	0.003*	0.002*
6+50	90	CSA1-SD-0675-01	0.0002*	0.015*	0.002*
6+00	98	CSA1-SD-0725-01	0.0002*	0.006*	0.002*
5+50	102	CSA1-SD-0725-01	0.0002*	0.030*	0.002*
5+00	108	CSA1-SD-0825-01	0.0002*	0.030*	0.002*
4+50	113	CSA1-SD-0875-01	0.0002*	0.015*	0.002*
4+00	112	CSA1-SD-0925-01	0.0002*	0.030*	0.002*
3+50	120	CSA1-SD-0975-01	0.0002*	0.015*	0.002*
3+00	124	CSA1-SD-1025-01	0.0002*	0.030*	0.002*
3+00	124	CSA1-SD-1025-01	0.00024	0.030*	0.002*
3+00	124	CSA1-SD-1025-01	0.0002*	0.030*	0.002*
2+50	129	CSA1-SD-1075-01	0.0002*	0.030*	0.002*
2+00	121	CSA1-SD-1125-01	0.0002*	0.015*	0.002*

C115-5

CAHOKIA SANDS
Percent Solids



VOLATILES DETERMINATION OF CAHOKIA SANDS & CONTAMINATED SEDIMENT

Dish #	SAMPLE	I.D. #	DATE	Station	C DISH	D WET DISH+SAMPLE	(D-C) WET WEIGHT	F DRY DISH+SAMPLE	(F-C) DRY WEIGHT	% Water	G VOLATILE DISH+SAMPLE	(G-F) VOLATILE WEIGHT	1-[(G-F)/(F-C)] PERCENT VOLATILE
	Sediment	56548		1646	19.31	34.09	14.78	26.39	7.08	52.10%	25.68	6.37	10.03%
	Sediment	56552		1600	17.82	31.97	14.15	24.19	6.37	54.98%	23.42	5.60	12.09%
	Sediment	56559		1550	18.64	32.2	13.56	26.17	7.53	44.47%	23.20	4.56	39.44%
	Sediment	56564		1500	19.06	32.31	13.25				25.35	6.29	52.53%
	Sediment	56550		1475	18.65	32.67	14.02	25.82	7.17	48.86%	24.65	6.00	16.32%
	Sediment	56546		1450	18.3	33.47	15.17	23.07	4.77	68.56%	22.52	4.22	11.53%
	Sediment	56540		1400	17.41	32.03	14.62	25.12	7.71	47.26%	24.33	6.92	10.25%
	Sediment	56542		1250	17.58	34.15	16.57	26.75	9.17	44.66%	22.74	5.16	43.73%
	Sediment	56544		1200	16.83	32.13	15.30	24.32	7.49	51.05%	23.36	6.53	12.82%
	Sediment	56562		900	18.78	32.25	13.47				23.61	4.83	64.14%
	Sediment	56560		850	18.21	31.10	12.89				21.92	3.71	71.22%
	Sands	56549		1650	19.44	35.4	15.96	31.57	12.13	24.00%	31.33	11.89	1.98%
	Sands	56553		1600	17.93	31.65	13.72	28.50	10.57	22.96%	28.36	10.43	1.32%
	Sands	56558		1550	16.89	32.93	16.04	27.86	10.97	31.61%	27.45	10.56	3.74%
	Sands	56565		1500	18.56	30.57	12.01				27.55	8.99	25.15%
	Sands	56551		1475	18.39	31.53	13.14	28.17	9.78	25.57%	28.00	9.61	1.74%
	Sands	56547		1450	18.28	31.93	13.65	27.49	9.21	32.53%	27.02	8.74	5.10%
	Sands	56541		1400	18.32	33.40	15.08	29.59	11.27	25.27%	29.36	11.04	2.04%
	Sands	56539		1365	18.22	31.37	13.15	27.82	9.60	27.00%	27.57	9.35	2.60%
	Sands	56543		1250	17.22	31.17	13.95	28.99	11.77	15.63%	27.60	10.38	11.81%
	Sands	56545		1200	17.4	32.30	14.90	28.33	10.93	26.64%	28.13	10.73	1.83%
	Sands	56563		900	16.35	29.99	13.64				26.22	9.87	27.64%
	Sands	56561		850	18.31	30.74	12.43				27.36	9.05	27.19%

	CAHOKIA SANDS				DEAD CREEK SEDIMENT			
STATION	Percent Moisture	Percent Volatiles	Percent Non-Solid	Percent Solids	Percent Moisture	Percent Volatiles	Percent Non-Solid	Percent Solids
1650	24.00%	1.98%	25.98%	74.02%	52.10%	10.03%	62.13%	37.87%
1600	22.96%	1.32%	24.28%	75.72%	54.98%	12.09%	67.07%	32.93%
1550	31.61%	3.74%	35.35%	64.65%	44.47%	39.44%	83.91%	16.09%
1500	0.00%	25.15%	25.15%	74.85%	0.00%	52.53%	52.53%	47.47%
1475	25.57%	1.74%	27.31%	72.69%	48.86%	16.32%	65.18%	34.82%
1450	32.53%	5.10%	37.63%	62.37%	68.56%	11.53%	80.09%	19.91%
1400	25.27%	2.04%	27.31%	72.69%	47.26%	10.25%	57.51%	42.49%
1365	27.00%	2.60%	29.60%	70.40%	44.66%	43.73%	88.39%	11.61%
1250	15.63%	11.81%	27.44%	72.56%	51.05%	12.82%	63.86%	36.14%
1200	26.64%	1.83%	28.47%	71.53%	0.00%	64.14%	64.14%	35.86%
900	0.00%	27.64%	27.64%	72.36%	0.00%	71.22%	71.22%	28.78%
850	0.00%	27.19%	27.19%	72.81%	24.00%	1.98%	25.98%	74.02%

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	Cerro Copper - Dead Creek CS-A	Y / N

SAMPLERS: *(Signature)* (Printed) Tim Parini

PARAMETERS: NO. OF CONTAINERS; Sediment; Subsediment

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Sediment	Subsediment	REMARKS
56564	8/7			✓	15+00	1	✓		
56565	8/7			✓	15+00	1		✓	Elevation: 392.3

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Timothy S. Parini	8/7 0930				
(Printed) Timothy S. Parini		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	Cerro Copper - Dead Creek CS-A	Y / N

SAMPLERS: *(Signature)* (Printed) Tim Porini

PARAMETERS: NO. OF CONTAINERS; Sediment; Subsediment

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Sediment	Subsediment	REMARKS
56564	8/7			✓	15+00	1	✓		
56565	8/7			✓	15+00	1		✓	Elevation: 392.3

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
(Printed) Timothy S. Porini	8/7 0930	(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
# 111	CERRO COPPER - DEAD CREEK CS-A	Y / N

SAMPLERS: *(Signature)* L.S. Perini (Printed) Tim Perini

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS: Sediment	PARAMETERS: Subsediment	REMARKS
56562	8/6	3 45		✓	9+00	1	✓		
56563	8/6	3 45		✓	9+00	1		✓	Elevation : 390.52'

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
L.S. Perini	8/6/90 340				
(Printed) Timothy S. Perini		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	CERRO COPPER - DEAD CREEK CS-A	Y / (N)

SAMPLERS: *(Signature)* L-T-S. Perini (Printed) Tim Perini

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS: Sediment	PARAMETERS: Subsediment	REMARKS
56562	8/6	3:45		✓	9+00	1	✓		
56563	8/6	3:45		✓	9+00	1		✓	Elevation: 390.52'
111									

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
L-T-S. Perini	8/6/90 3:40				
(Printed) Timothy S Perini		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
# 111	CERRO COPPER - DEAD CREEK CS-A	Y / N

SAMPLERS: *(Signature)* Tim Perini (Printed)

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS: SEDIMENT	PARAMETERS: SUBSEDIMENT	REMARKS
56560	8/4/90	1:40		✓	STATION 8+50		✓		
56561	8/4/90	1:40		✓	STATION 8+50/85' from BL			✓	ELEVATION: 391.02'

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Tim Perini	8/4/90 1:40				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
# 111	CERRO COPPER - DEAD CREEK CS-A	Y / (N)

SAMPLERS: *(Signature)* [signature] **(Printed)** [signature]

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SEDIMENT	SUBSEDIMENT	REMARKS
5650	8/4/90	1:40		✓	STATION 8+50		✓		
5651	8/4/90	1:40		✓	STATION 8+50/85' from BL			✓	ELEVATION: 391.02'

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[signature]	8/4/90 1:40				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y / N
	CERRO COPPER		

SAMPLERS: (Signature) Kevin McGowan (Printed) KEVIN McGOWAN

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SEDIMENT	SUB SEDIMENT	REMARKS
56558	8/4/90	10[30]		✓	STA 15+50 CENTER			✓	ELEV. 391.85
56559	↓	10[30]		✓	STA 15+50 CENTER		✓		

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin McGowan (Printed)	8/4/90 1040	(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
(Printed)		(Printed)		Cerro LAB

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y / N
	CERRO COPPER		

SAMPLERS: *(Signature)* [signature] (Printed) KEVIN M. GOWAN

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SED. MEAT	SUB SEDIMENT	REMARKS
56558	8/4/90	10[30]		✓	SM 15-150 CENTER			✓	ELEV. 391.85
56559	↓	10[30]		✓	SM 15150 CENTER		✓		
1									

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[signature]	8/4/90 1040				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
				CERRO LAB
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
# 111	Cerro Copper - Dead Creek CS-A	Y / N

SAMPLERS: *(Signature)* (Printed)

PARAMETERS: NO. OF CONTAINERS; Sediment; Subsediment

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Sediment	Subsediment	REMARKS
56552	8/3/90	10:40 am		✓	16+00 \ 80.0' from BL		✓		Elevation: 393.75
56553	8/3/90	10:40 am		✓	16+00 \ 80.0' from BL			✓	Elevation: 393.75

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Rusty S. Pa...	8/3/90				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	CERRO COPPER (DEAD CREEK-CSA)	Y / N

SAMPLERS: *(Signature)* Michael A Grasso (Printed) Michael Grasso

PARAMETERS: NO. OF CONTAINERS; Sediment; Sub. Sediment

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Sediment	Sub. Sediment	REMARKS
56550	8/2/90	1420		✓	14 + 75	1	✓		393.8 EL - 95' B
56551	8/2/90	1420		✓	14 + 75	1		✓	↓

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Michael A Grasso	8/2/90				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
				CERRO LAB.
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	CERRO COPPER	Y / N

SAMPLERS: (Signature) [signature] (Printed) Michael Grasso

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS: SEDIMENT	PARAMETERS: SUBSEDIMENT	REMARKS
56548	8/1/90	17 00		✓	16+46 60 STAKE	1	✓		—
56549	↓	↓		✓	16+46 60 STAKE	1		✓	395.265' ELEV.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature] S. Pa	8/2 7:35				
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME
#111	CERRO COPPER / DEAD GREEK

SAMPLERS: *(Signature)* (Printed)

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS: Sediment	PARAMETERS: Subsediment	REMARKS
56546	8/1	11:45		✓	14+50 \ S. Creek	1	✓		ELEVATION = 393.42'
56547	8/1	11:45		✓	14+50 \ S. Creek	1		✓	ELEVATION = 393.42'

INDUSTRIAL HYGIENE SAMPLE: Y / (N)

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE
111	CERRO COPPER / DEAD CREEK SITE	Y ✓

SAMPLERS: (Signature) [signature] (Printed) Michael Grasso

PARAMETERS: NO. OF CONTAINERS; SEDIMENT; SUB SEDIMENT

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SEDIMENT	SUB SEDIMENT	REMARKS
56544	7/31/90	1500		✓	12+00 / 42' off BL		✓		SAMPLE TAKEN @ 395.6'
56545	↓	1500		✓	12+00 / 42' off BL			✓	" " " "

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	7/31/90 1530				
(Printed) Michael Grasso		(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
				Cerro Cu 6
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y / N
	CERRO COPPER CA-2		

SAMPLERS: (Signature) Michael A Grasso (Printed) Michael L Grasso

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SEDIMENT	SUBSEDIMENT	REMARKS
56542	7/31/90	455		✓	12+30	1	✓		75' FROM CENTERLINE
56543	↓	455		✓	" "	1		✓	" "
Sed #2					44.7 ~~55.6~~ % H_2O 43.73% Vol	2			Tested 7/31
Sands #3					15.6% H_2O 11.82% Vol	1			
Retest	8/1/90								
Sed									
Sands									

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Michael A Grasso					
(Printed) Michael Grasso		(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks CERRO LAB.
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y / N
	Cerro Copper		

SAMPLERS: *(Signature)* Richard G Thomas (Printed) Michael A Grasso

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SED. MENT	SUB. SEDIMENT	REMARKS
									Vols
56540	7/27	1030		✓	STAT #14+00	1	✓		ELEVATION 392.45 10.25 10
56541	7/27	1030		✓	" "	1		✓	BASE LINE 93' 2.09

JMH

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Richard G Thomas	7/27/90 1045				
(Printed) Michael A Grasso		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

Versar INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y / N
	CERRO COPPER		

SAMPLERS: *(Signature)* Michael A Grasso (Printed) Michael A GRASSO

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	SUBSEDIMENT	REMARKS
56539	7/26/90	1045			SOUTH POND STA. 13+65 - 110' OFF RR	1	✓	VOA's 2.670

JMH 7-26-90

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Michael A Grasso	7/26/90 1050				
(Printed) MICHAEL GRASSO		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks CERRO LAB.
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

VOLATILES DETERMINATION OF CAHOKIA SANDS & CONTAMINATED SEDIMENT

Dish #	SAMPLE	I.D. #	DATE	Station	C DISH	D WET DISH+SAMPLE	(D-C) WET WEIGHT	F DRY DISH+SAMPLE	(F-C) DRY WEIGHT	% Water	G VOLATILE DISH+SAMPLE	(G-F) VOLATILE WEIGHT	1-[(G-F)/(F-C)] PERCENT VOLATILE
	Sands												
BLANK SKINNY	Sediment	56560	8/4	850	18.21	31.10					21.92		
Blank FAT	Sands	61	8/4	850	18.31	30.74					27.36		
F	Sediment	62	8/6	900	18.78	32.25					23.61		
E	Sands	63	8/6	900	1635	29.99					26.22		
G	Sediment	64	8/7	1500	19.06	32.31					25.35		
1	Sands	65	8/7	1500	18.56	30.57					27.55		
	Sediment-rerun												
	Sands-rerun												
	Sediment												
	Sands												
	Sediment												
	Sands												
	Sediment												
	Sands												
	Sediment												
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	Sands												
	Sediment												
	Sands												
	Sediment												
	Sands												

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VOLATILES DETERMINATION OF CAHOKIA SANDS & CONTAMINATED SEDIMENT

SAMPLE	I.D. #	DATE	C DISH	D WET DISH+SAMPLE	(D-C) WET WEIGHT	F DRY DISH+SAMPLE	(F-C) DRY WEIGHT	% Water	G VOLATILE DISH+SAMPLE	(G-F) VOLATILE WEIGHT	1-[(G-F)/(F-C)] PERCENT VOLATILE
Sands		7/23	18.53	34.40	15.87	32.13	13.60	14.3	30.45	11.92	12.3%
Sediment		7/23	19.07	35.85	16.78	32.21	13.14	21.7	23.65	4.58	65.1%
Sands	56539	7/26	18.22	31.37	13.15	27.82	9.60	27.0	27.57	9.35	2.60%
Sediment	56540	7/27	17.41	32.03	14.62	25.12	7.71	47.3	24.33	6.92	10.25%
Sands	" 41	7/27	18.32	33.40	15.08	29.59	11.27	25.3	29.36	11.04	2.04%
Sediment	56542	7/31	17.58	34.15	16.57	26.75	9.17	44.7	22.74	5.16	43.73%
Sands	" 43	7/31	17.22	31.17	13.96	28.99	11.77	15.7	27.60	10.38	11.81%
Sediment Perun	56542	7/31									
Sands Perun	56543	7/31									
Sediment	56544	7/31									
Sands	56445	7/31									
Sediment											
Sands											
Sediment											
Sands											

ENVIRONMETRICS

2345 Millpark Drive
Maryland Heights, MO 63043
(314) 427-0550

August 1990

Dear Sir or Madam:

This letter is to inform you that I am no longer with Envirodyne/TCT, and have joined Environmetrics, Inc. as Vice President in charge of Business Development. I am excited about this move and look forward to continuing our past relationship and working with you and your company in the near future.

Environmetrics is a privately-held independent laboratory that was established in 1978 and is engaged in environmental analysis, oil testing and R&D projects for various clients. Due to the rapid growth of the company, Environmetrics moved last year into a new 23,000 square foot state-of-the-art laboratory.

This expansion has positioned Environmetrics to become one of the most efficient environmental laboratories in the Midwest. Normal sample turn-around is 1-2 weeks, while our FASTRAK service provides 72 hour turnaround for priority pollutants, volatiles, and BNA's.

Environmetrics will expand its capabilities and services in the future so don't hesitate to discuss your needs with me at anytime. Our toll-free number is 1-800-333-3278. When you are in St. Louis, I would be pleased to give you a tour of our new laboratory and discuss your needs with our staff.

Sincerely yours,

ENVIRONMETRICS, INC.

Shaaban Ben-Poorat

Shaaban Ben-Poorat
Vice President
Business Development

SP/kjv

Enclosure

mL/L. Where a separation of settleable and floating materials occurs, do not estimate the floating material as settleable matter.

b. Gravimetric:

1) Determine total suspended solids of well-mixed sample (Section 209C).

2) Pour a well-mixed sample into a glass vessel of not less than 9 cm diam using not less than 1 L and sufficient to give a depth of 20 cm. Alternatively use a glass vessel of greater diameter and a larger volume of sample. Let stand quiescent for 1 h and, without disturbing the settled or floating material, siphon 250 mL from center of container at a point halfway between the surface of the settled material and the liquid surface. Determine total suspended solids (milligrams per liter) of this supernatant liquor (Section 209C). These are the nonsettleable solids.

4. Calculation

mg settleable solids/L

= mg total suspended solids/L

− mg nonsettleable solids/L

5. Precision and Accuracy

Precision and accuracy data are not now available.

209 F. Total, Fixed, and Volatile Solids in Solid and Semisolid Samples

1. General Discussion

a. Applicability: This method is applicable to the determination of total solids and its fixed and volatile fractions in such solid and semisolid samples as river and lake sediments, sludges separated from water and wastewater treatment processes, and sludge cakes from vacuum filtration, centrifugation, or other sludge dewatering processes.

b. Interferences: The determination of both total and volatile solids in these materials is subject to negative error due to loss of ammonium carbonate and volatile organic matter during drying. Although this is true also for wastewater, the effect tends to be more pronounced with sediments, and especially with sludges and sludge cakes. The mass of organic matter recovered from sludge and sediment requires a longer ignition time than that specified for wastewaters, effluents, or polluted waters. Carefully observe specified ignition time and temperature to control losses of volatile inorganic salts. Make all weighings quickly because wet samples tend to lose weight by evaporation. After drying or ignition, residues often are very hygroscopic and rapidly absorb moisture from the air.

2. Apparatus

All the apparatus listed in Section 209A.2 is required except that a balance capable of weighing to 10 mg may be used.

3. Procedure

a. Total solids:

1) Preparation of evaporating dish—If volatile solids are to be measured, ignite a clean evaporating dish at 550 ± 50°C for 1 h in a muffle furnace. If only total solids are to be measured, heat dish at 103 to 105°C for 1 h in an oven. Cool in desiccator, weigh, and store in desiccator until ready for use.

2) Sample analysis

a) Fluid samples—If the sample contains enough moisture to flow more or less read-

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ily, stir to homogenize, place 25 to 50 g in a prepared evaporating dish, and weigh. Evaporate to dryness on a water bath, dry at 103 to 105°C for 1 h, cool to balance temperature in an individual desiccator containing fresh desiccant, and weigh.

b) Solid samples—If the sample consists of discrete pieces of solid material (dewatered sludge, for example), take cores from each piece with a No. 7 cork borer or pulverize the entire sample coarsely on a clean surface by hand, using rubber gloves. Place 25 to 50 g in a prepared evaporating dish and weigh. Place in an oven at 103 to 105°C overnight. Cool to balance temperature in an individual desiccator containing fresh desiccant and weigh.

b. Fixed and volatile solids: Transfer to a cool muffle furnace, heat furnace to 550 ± 50°C, and ignite for 1 h. (If the residue from 2) above contains large amounts of organic matter, first ignite the residue over a gas burner and under an exhaust hood in the presence of adequate air to lessen losses due to reducing conditions and to avoid odors in the laboratory.) Cool in desiccator to balance temperature and weigh.

4. Calculation

$$\% \text{ total solids} = \frac{(A - B) \times 100}{C - B}$$

$$\% \text{ volatile solids} = \frac{(A - D) \times 100}{A - B}$$

$$\% \text{ fixed solids} = \frac{(D - B) \times 100}{A - B}$$

where:

A = weight of dried residue + dish, mg,
B = weight of dish,
C = weight of wet sample + dish, mg, and
D = weight of residue + dish after ignition, mg.

5. Precision and Accuracy

Precision and accuracy data are not now available.

209 G. Reference

1. SOKOLOFF, V.P. 1933. Water of crystallization in total solids of water analysis. *Ind. Eng. Chem.*, Anal. Ed. 5:336.

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